



Faculty of Cognitive Sciences and Human Development

**THE DEVELOPMENT OF WEB-BASED SUPERVISOR-SUPERVISEE  
ASSIGNING SYSTEM USING RULE-BASED ALGORITHM**

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(Cognitive Science)  
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Final Year Project Report ☒

Masters ☐

PhD ☐

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**THE DEVELOPMENT OF WEB-BASED SUPERVISOR-SUPERVISEE ASSIGNING  
SYSTEM USING RULE-BASED ALGORITHM**

YEOH CHIEN DIN

This project is submitted in partial fulfilment of the requirements for a  
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(YEOH CHIEN DIN)

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## TABLE OF CONTENTS

|  |      |
|--|------|
| LIST OF TABLES .....                                   | v    |
| LIST OF FIGURES .....                                  | vi   |
| ABSTRACT.....  | viii |
| CHAPTER ONE INTRODUCTION.....                          | 1    |
| CHAPTER TWO LITERATURE REVIEW .....                    | 7    |
| CHAPTER THREE METHODOLOGY .....                        | 19   |
| CHAPTER FOUR SYSTEM DEVELOPMENT & IMPLEMENTATION ..... | 29   |
| CHAPTER FIVE SYSTEM EVALUATION.....                    | 43   |
| REFERENCE.....   | 48   |
| APPENDIX A INFORMED CONSENT LETTER.....                | 51   |
| APPENDIX B UTAUT QUESTIONNAIRE PAPER.....              | 52   |

## LIST OF TABLES

|  |    |
|--|----|
| Table 1. Comparison of the reviewed systems .....                          | 14 |
| Table 2. The analyzed evaluation result from the UTAUT Questionnaire ..... | 44 |



## LIST OF FIGURES

|   |    |
|---|----|
| Figure 1.1. Google Forms webpage.....                                       | 3  |
| Figure 1.2. The system main modules. ....                                   | 5  |
| Figure 2.1. Current System Work Flow for FYP Management .....               | 10 |
| Figure 2.2. Overviews of the Online Final Year Project's system scopes..... | 12 |
| Figure 3.1. Stages of Waterfall Model .....                                 | 20 |
| Figure 3.2. Context level data flow diagram of the system .....             | 22 |
| Figure 3.3. First level data flow diagram of the system .....               | 23 |
| Figure 3.4. Entity relationship diagram of the system .....                 | 24 |
| Figure 3.5. Webpage for courses' grade input .....                          | 25 |
| Figure 3.6. Webpage for FYP's fields and supervisors selection .....        | 26 |
| Figure 3.7. UTAUT Model diagram .....                                       | 27 |
| Figure 4.1. The overall system modules. ....                                | 29 |
| Figure 4.2. The coding for registering user.....                            | 30 |
| Figure 4.3. The diagram of the system's register interface .....            | 31 |
| Figure 4.4. The warning prompt for the similar e-mail address. ....         | 31 |
| Figure 4.5. Information update interface .....                              | 32 |

Figure 4.6. The interface for information display .....33

Figure 4.7. The coding from the assignation module .....33

Figure 4.8. The diagram of the ‘users’ database stored in MySQL .....35

Figure 4.9. The Composer webpage .....37

Figure 4.10. The Laragon software.....38

Figure 4.11. The home page of the system .....39

Figure 4.12. The register page and the login page.....39

Figure 4.13. The changed interface after user login .....40

Figure 4.14. Managing account page 1 .....40

Figure 4.15. Managing account page 2 .....41

Figure 4.16. The My Account page .....41

Figure 4.17. The Administration page .....42

## **ABSTRACT**

Final year project is a crucial coursework, as it is the indicator of a student's ability to apply the knowledge acquired throughout their years of studies in their project. In Faculty of Cognitive Sciences and Human Resources, UNIMAS, all final year students are assigned with at least one supervisor to inspect their FYP. Approximately 200 students are assigned with supervisors by Cognitive Sciences coordinator in year 2016. The assigning task is shown to be time taking, and should be enhanced.

Therefore, this research project developed a web-based Supervisor-supervisee Assigning System that can automate the coordinator's assigning task. The Supervisor-supervisee Assigning System is developed with PHP together with Laravel Framework and MySQL. And Unified Theory of Acceptance and Use of Technology (UTAUT) is used to evaluate the acceptance of this new system. The application system is accessible through World Wide Web, so final year students can update their information online. Coordinator can receive an assigned list of supervisee in seconds through the online system. In the following chapters, the overview of the system architecture, system design, system development and summarized evaluation result are discussed in detail.

## **ABSTRACT**

Projek tahun akhir adalah satu keperluan untuk menguji pelajar tentang penggunaan mengenai ilmu mereka pelajari sepanjang tahun pengajian di universiti. Semua pelajar tahun akhir di Fakulti Sains Kognitif dan Sumber Manusia, UNIMAS akan menerima sekurang-kurangnya seorang penyelia untuk membimbing mereka dalam project tahun akhir. Pada tahun 2016, sebanyak 200 orang pelajar telah dialihkan dengan penyelia oleh penyelaras Sains Kognitif. Tugas pengasingan penyelia ini amat memerlukan masa dan ia harus diperbaiki.

Oleh itu, projek penyelidikan ini telah membuat web-based Supervisor-supervisee System yang boleh mengautomasikan tugas pengalihan supervisee. Sistem ini dibina dengan perisian PHP bersama-sama dengan Laravel framework dan MySQL. Unified Theory of Acceptance and Use of Technology (UTAUT) juga digunakan untuk menilai tingkat penerimaan penyelia pada sistem baru ini. Sistem aplikasi ini boleh diakses melalui World Wide Web, pelajar tahun akhir boleh mengemas kini maklumat mereka dalam talian. Penyelaras juga boleh mendapatkan senarai supervisee dengan segera dalam talian. Bab-bab yang berikut akan memberi gambaran keseluruhan seni bina sistem, reka bentuk sistem, pembangunan sistem dan hasil penilaian dengan terperinci.

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.0 Introduction**

Final Year Project (FYP) is a compulsory course for all undergraduate students in their final year. It is a must that they completed the course before graduated from university. Its purpose is to provide students a chance to utilize their knowledge and skills learnt throughout the study. For further enhance their learning experiences, supervisors are assigned to guide the students in their FYP course works.

The Faculty of Cognitive Sciences and Human Development (FCSHD) of University Malaysia of Sarawak (UNIMAS) adopts the same practice. All the FCSHD's programs, Cognitive Sciences (CS), Human Development Resources (HR) and Counseling have made FYP a compulsory course. In fact, an accumulation of 7 course credits are given to the course FYP (Faculty Guidebook of FCSHD, 2016). These credits are crucial to students, as they must fulfill the requisite credit numbers to complete the programs. This stresses the importance of student to treat the FYP course attentively.

The course initiates with students seek for interested FYP topic and suitable supervisor relative to the topic. According to Kathleen Cali, effective writing required a clear focus on the topic, so that thought can convey clearly to the readers. So it is very important that students pick the topic that they're interested to, so that they could fully commit in writing a good paper. And the critical factor of establishing focus is to be goal-directed and planned (Cali, 2003). The right

topic improves the students writing performance. Thus, the topic and supervisor selection should be treated seriously.

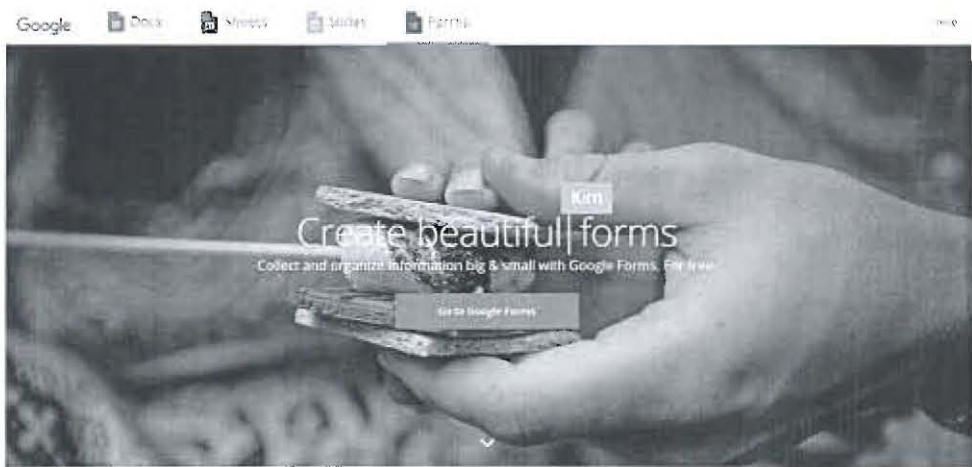
In this chapter, the FYP management system in FCSHD will be reviewed with the objective of developing a system that could match supervisors and assigns FYP's field for students efficiently.

## **1.1 Background**

The traditional way of FYP topic selection and supervisor matching are happened entirely offline. Generally, a list of FYP topic provided by lecturers is released on bulletin board for students review. Every student need to prompt the lecturers according to the topic they interested to gain more details. If they reached an agreement, then the student will take the FYP topic and accepting the lecturer's supervision throughout the course. If else, they need to look for others lecturer until they found the suitable topic.

Like Darwin's theory of evolution, the system changes and adapts over time due to the technologies' advancement. A lot of things had move online, technology like e-book and e-library are quite a norm these days. The current FYP topic selection system of Faculty of Cognitive Sciences and Human Development also utilizes the online technology. An online platform is used by FCSHD's students to submit application for their FYP's field and supervisor selection. In this case, FYP's field is adopt instead of FYP topic. This is because the Cognitive Sciences course involved plenty of interdisciplinary studies, which are computer science, philosophy, linguistic, psychology, neuroscience and anthropology. Providing numerous FYP topics for every related studies is challenging and not worth the efforts.

More detailed information about the FYP's management system is acquired through the interviewing of the FCSHD's coordinator of year 2016, Dr. Julia. The online technology, Google Forms is uses to create online application form that can spread to students easily. After student's submission, coordinator needs to download the application's data from Google Forms for analysis uses. FYP topic and supervisor is assigned mainly base on the CGPA and MUET result. (Julia, 2016)



*Figure 1.1* Google Forms webpage (Google Forms, 2016).

There is a number of similar software developed in others university. Basically, they are online web portal that is set up to manage FYP related matters, some with extra features and some less. For an example, Online Final Year Project System which developed by UTAR. It integrated the numerous functions in its web portal, such as title proposing, venue reservation, moderator of assignment and assignment marking (Lim, 2013).



## 1.2 Problem Statements

The FYP management of FCSHD is practically using the offline method, other than data collection, the rest of the work load are handled manually by the responsible coordinator. The coordinator's job includes making the application form, analyzing the collected data, FYP's field and supervisor arrangement, moderator arrangement, evaluation marks input and much more.

Evidently, the coordinator's job is heavy and time consuming. A coordinator, who is also a lecturer, had to spend part of their working hours on handling the FYP matters. According to Dr. Julia (2016), 2 working days which is roughly about 16 working hours are taken just to analyze the application form's data, assignation of student FYP's field and the associated supervisor. Furthermore, the tendency of late submission among students also causes delay to the working progress (Julia, 2016).

An online web portal that can automate the assignation of student's FYP field and the matching of supervisor and supervisee is a solution to the problems, and should be developed to reduce the coordinator's work load.

## 1.3 Objective of the system

Main objective:

- To design and develop a web-based supervisor assigning system for FCSHD

Specific objective:

- To develop a web-based system for supervisor assigning uses with PHP programming language
- To develop a matching system using rule-based algorithm



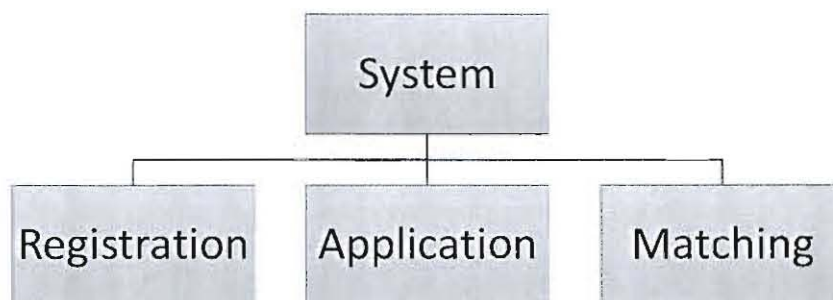
## 1.4 Contribution

The system could:

- Reduce coordinators workload and quicken the process of matching supervisor and supervisee.
- Help FCSHD with a web-based supervisor matching system that could be accessed without the limitation of geographical and time.

## 1.5 Scope of the system

Basically, the proposed project consists of three major modules. They are the registration module, the application module and the matching module. These core modules are designed to make the system works systematically.



*Figure 1.2* The system with three modules.

The first module, the registration module is essential for the security measures. All FYP course students must register an account before applying for their supervisors. It's to prevent the stacking of registration from the same person. Students have to input their persona information in

the registration, which include full name, matrix number, contacts, MUET result, and all the related courses' results.

In the application module, students have to select FYP fields and intended supervisors with the option of first choice, second choice and third choice. Students are permit to manage and change their application prior to the given deadline. The module works literary the way that first choice will be considered first, if it is not available then the second choice will be viewed.

The last module, matching module functions to allocate the supervisee to supervisor according to the information acquired. The information are gained through the registration module and the application module. The primary factor considered for allocate supervisees are their CGPA results. Students with better CGPA are given priority in getting their intended field and supervisor (Leung, et al., 2015). The other criteria that mattered included are MUET result and the related course's result to the selected field.

## **1.6 Conclusion**

In the nutshell, this chapter discusses the overall picture of the project. It is clear that the FYP management system of FCSHD can still be improved. The concerned matters in the management system are highlighted in the problem statements part. With proper development, the proposed Web-based Supervisor Assigning System could enhances the FYP management system of FCSHD.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

In this chapter, the Faculty of Cognitive Sciences and Human Development's (FSKPM) Final Year Project (FYP) management system is studied, and related research works are reviewed. The finding of these past studies will serve as a guideline for the development of the Supervisor-supervisee Assigning System.

#### **2.1 Final Year Project**

Final Year Project (FYP) is a compulsory course for every university undergraduates. Students must complete the course during the final year in order to graduate. FYP is purposed for students to synthesize the knowledge learnt throughout the years, and utilize them in solving specific problems. Through FYP, students get to polish their skills and knowledge, and acquiring experiences with the real world problems (López, Tormos, García, Olmeda, & Guardiola, 2003).

In FCSHD, FYP I and FYP II course is taken separately in the last two semesters. FYP I required students to produce a research proposal which includes Chapter 1, Chapter 2 and Chapter 3. It is aimed to introduce students the way to write and prepare research proposal systematically. While a complete final year thesis which includes Chapter 1 to Chapter 5 is required for FYP II. FYP II designed to teach deeper understanding about writing and carrying out research project to students. (Final Year Project Course Outline, 2016)

### **2.1.1 Cognitive Sciences**

Cognitive Sciences is one of the programs provided by FCSHD. It's a course that studies the interdisciplinary study of mind that operates at the intersection of philosophy, linguistics, psychology, computer science, neuroscience and anthropology (Friedenburg & Silverman, 2006). Cognitive Sciences' students learn about the faculty of language, perception, attention, emotion, reasoning and memory. For example, Gestalt Law of Perceptual explains how human mind sees things and views groups of small objects together into a larger object. Serial position effect shows us that when we read a list of items, we memorize clearer about the list's top and the bottom parts, but not the middle part. It happened due to the earlier item we read was rehearsed and put into the long term memory which is called the primacy effect, while the bottom part is encoded into the short term memory, so called the recency effect (McLeod, 2008).

These studies allow CS's students to understand better about how mind works, thus making them good designers. The background of computer science in CS also gives them a push in contacting with the information technology, thereby facilitating them to be a good software developer. The Web Programming course teaches how to code web with HTML, PHP and SQL; Human Computer Interaction course provides the knowledge of proper interaction principles for human to utilize with technologies; Artificial Intelligence course teaches the way computer can be coded to simulate human works. All these courses teach knowledge and skills that support the development of this web-based Supervisor-supervisee Assigning System.

## **2.2 Interview with Cognitive Sciences Coordinator**

An Interview session is held with Dr. Julia (2016), the coordinator of Cognitive Sciences' FYP. According to the interview, single coordinator is assigns from time to time among the lecturers. Dr. Julia has handled the job for three semesters, and will pass the coordinator job to the next coordinator in the following semester.

Assigning field of FYP and corresponding supervisor is one of the time assuming task. The task required certain amount of time and attention. All students need to be assigned in accordance to their CGPA, MUET result and area of study. The assignation standard is, students with higher cumulative grade point average (CGPA) are given better priority in acquiring their choices. MUET result is reviewed in the role of pairing supervisor. Students with lower MUET band will not paired with foreign supervisors. Because some foreign supervisors aren't fluent with local language, so English is the major communication language between supervisee and supervisor. (Julia, 2016)

The whole assigning process took about 16 working hours. The process includes the analysis of student's information and assigning them accordingly. The first list is created and revealed to all the FYP students. Unsatisfied students are allowed to changes before reaching the dateline. At last, the finalized list is released. There is several concerned problems found, and they are the delayed schedule as some students tend to exceed the submission dateline, and the uneven amount of supervisee for some supervisors. (Julia, 2016)



2.3 Current System Work Flow

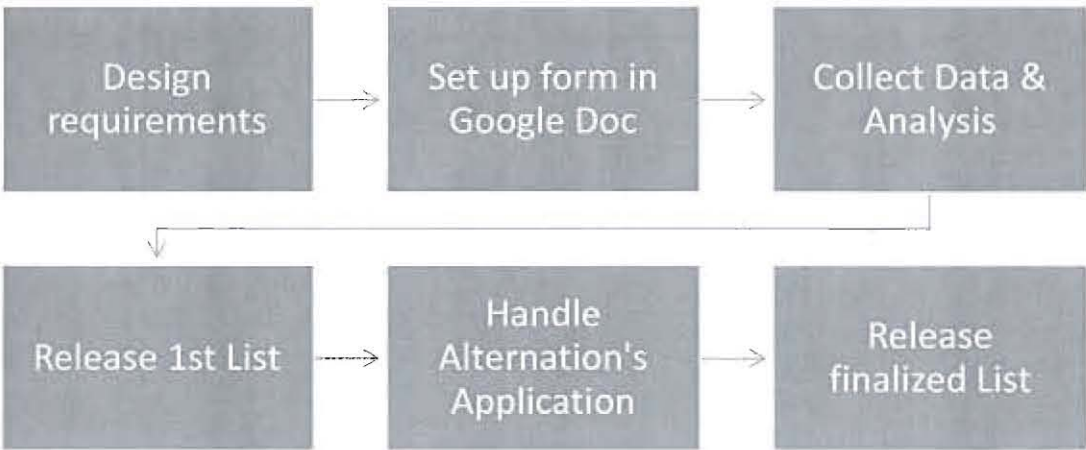


Figure 3.1. Current System Work Flow for FYP Management

Firstly, the coordinator will set up specific requirements for the FYP application. A free online application, Google Forms is used in making the application form and releasing it online for students to fill in their information. The data is collected from Google Forms after the submission date. The process of data analyzing and decision making proceed. The production of the first assignation results took about 2 working days. The second application open will for another two week time for receiving assignation alternation request. The tendencies of late submission by students always lead to progress delaying. An automation system should be developed to support the task and at the same time enhancing the system production efficiency. This should relieve the coordinators' work and allowing them spend more time in significance matter.

## **2.4 Supervisor**

Supervise is define by Oxford Dictionaries as observe and direct execution of task and activity (Supervise, n.d.). So a supervisor is a skilled and experienced person, who is capability to teach and instruct others the proper way to do something. In our case, supervisors are the person who give strategic advice and guidance to students when they faced difficulty in their FYP. Supervisors is crucial in course FYP, students who're lack of experience, tend to make unaware mistakes. Students should consider seriously on the matter of the suitable supervisors who could aid them best in their academic.

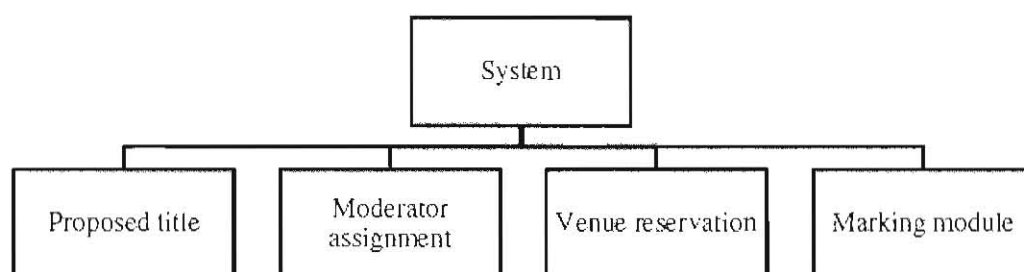
## **2.5 Related work**

There is a number of related researches and development done on the web-based supervisor assignation system. The research papers can be generalized into two group, FYP Management Systems and the FYP Project Selection System. Both kind of system rarely integrated with the topic matching or supervisee-supervisor matching system.

### **2.5.1 Online Final Year Project System**

Online Final Year Project System for FICT, UTAR using AMP technologies made by Lim Shu Shin (2013). The modules of the system included the title proposing, moderator of assignment, venue reservation and assignment marking. FYP's titles proposed by lecturers are shown in a list online, so students could book for the title they interested. They will then meet the lecturer for further information. If they come into agreement, the lecturer will act as their supervisor on the

FYP topic selected. Moderator assignment functions as the collector of information of moderator's workload and the area they intended to moderate. Venue reservation is the module for room booking for the uses for presentation or meeting. Lastly, the marking system which store marks in real time whenever inspectors gave marks to paper or research.



*Figure 3.2.* Overviews of the Online Final Year Project's system scopes.

### **2.5.2 Final Year Project Management System**

The project named “The Development of a Final Year Project Management System for Information Technology Programmes” by Leung and his research group (2015). It is an online platform develop to facilitate with the FYP for Information Technology Programmes. The system consists of five modules, which is project allocation module, communication module, project management module, file sharing and repository module, and submission and grading module. This system consists more functions compare to the previous system. There is communication system which help students contact their supervisor. Project management system that aid in monitoring project schedule achievements, and also file sharing feature that letting students to share the project code and papers between group members.